Report No. IITRI-L6021-11 (Quarterly Progress Report)

DEVELOPMENT OF AN ORALLY EFFECTIVE INSECT REPELLENT

Headquarters
U.S. Army Medical Research
and Development Command
Office of the Surgeon General
Washington, D.C.

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IITRI Project L6021 Contract No. DA-49-193-MD-2281

May 1 through July 31, 1967

# I. INTRODUCTION

During this report period, we completed fabrication of two additional bitometers and are now completing the final calibration of these instruments.

We developed a new computer program that essentially incorporates all the desirable features of the old program. In addition, the new program gives a continuous estimate of how the repellency of test compounds differs from that of controls. Thus the data are handled much more efficiently.

We also continued work with the crayfish intestine preparation in efforts to test the GABA\* hypothesis in a physiological system.

Gamma-aminobutyric acid.

## II. THE NEW BITOMETERS

We have constructed a total of three bitometers. 1,2 These instruments are in the final stages of calibration, and preliminary tests have shown that they are sufficiently sensitive to respond to the biting of even a single mosquito and that they operate satisfactorily in our assay system. We anticipate that these meters will considerably simplify and expedite the experimental work.

## III. THE NEW COMPUTER PROGRAM

In previous reports the computer printout for the repellency test data gave confidence limits in terms of differences from control values. As a result, we could state with a given level of assurance, reflected in the 95% confidence limit, whether a given compound significantly decreased the mosquito biting of a treated mouse over that of an untreated control. We had no means, however, of estimating how different from control values the tests were.

In order to estimate this difference, we modified the computer program, 1,2 so that the control values could be multiplied by any fraction, i.e., 0.9 or 0.75, etc., to ascertain the point at which repellency did not differ significantly from the fractional value of controls at the 95% confidence level.

<sup>&</sup>lt;sup>1</sup>Kashin, P., "Development of an Orally Effective Insect Repellent," Report No. IITRI-L6021-9 (Quarterly Progress Report), Contract No. DA-49-193-MD-2281 conducted by IIT Research Institute, Chicago, Illinois, January 31, 1967.

<sup>&</sup>lt;sup>2</sup>Kashin, P., "Development of an Orally Effective Insect Repellent," Report No. IITRI-L6021-10 (Quarterly Progress Report), Contract No. DA-49-193-MD-2281 conducted by IIT Research Institute, Chicago, Illinois, April 30, 1967.

Thus the compounds could be ranked according to their repellency at given treatment levels, even when two compounds are repellent at the 95% level of confidence. In other words, we can state that one compound reduces biting more than another, even though both are significantly repellent.

This method of handling the data, however, became cumbersome. The fractions chosen for multiplying the control values were discrete, and a continuous comparison in terms of differences from controls could not be obtained. This method was also expensive in terms of computer time, since the data had to be computed separately for each fraction of the control values.

Thus a new computer program was developed that gives a continuous ranking of compounds in terms of control values. It is now possible to determine at a glance the effectiveness of a repellent, i.e., how much biting is decreased when compared to the optimally weighted controls. For clarity, we have recomputed the data that we submitted in elast report with the new program. The appendix shows these data. Further assays that were subsequently performed on these same compounds are also included in this data. Further testing needs to be done with some of these compounds and the lower limits of repellency for compounds whose limit has not yet been reached should be established.

<sup>&</sup>lt;sup>3</sup>Kashin, P., "Development of an Orally Effective Insect Repellent," Report No. IITRI-L6021-8 (Annual Report), Contract No. DA-49-193-MD-2281 conducted by IIT Research Institute, Chicago, Illinois, October 31, 1966.

It should be mentioned that the "conditioning" procedure described in the last report, 2 i.e., placing a bronze mesh on the mosquito container 24 hr before the test, is no longer being done. A statistical discriminant function analysis of the controls has shown that this procedure does not significantly improve or in any way change the results of the tests.

The major change in the proputer printout can be seen in the column that was formerly eled "confidence level (PCT);" this column now reads "weighte" reent of controls." Two numbers for each test compound are entered in this column. The first, unlabeled number is the percentage of decrease in biting from the controls for a given series of tests. The second number is labeled "upper bound." This number replaces the confidence limit; any value below 100 indicates that this compound is significantly repellent at the 95% confidence limit. The magnitude of the number indicates how close to the 95% confidence limit the compound is repellent. A very low number indicates that the compound is more repellent than a high number even though both may fall within the 95% confidence limit if they are less than 100. A value of 100 or greater for the upper bound indicates that the compound is not significantly repellent when compared with parallel controls and that it does not fall within the 95% confidence limit. Comparison of the entries in this report with those in the previous report 2 11lustrates these points. Thus, with the new computer program, the repellency of various compounds can be ranked according

to their differences from controls at similar levels of treatment and sound judgements of relative repellency are based upon firm statistical grounds.

## IV. STATISTICAL FORMULAE

The following discussion presents the formulae used to define the percent of control and the upper limit (bound), which indicates statistical significance, and includes a brief description of the application of these indicators.

The program for the contrast analysis was modified so that the weighted mean of the repellency index is given as a percent of the control response, and statistical significance is indicated by the 95% confidence level upper bound. This level is represented by a value of 100 for this statistic. This replaces the indication of confidence level and permits a comparative ranking of compounds by their significance level. Uncertainty concerning the extremes of the distribution are ameliorated by this approach. The 95% limits are relatively stable with respect to variations from normality (i.e., a robust statistical estimate) as compared with higher levels of confidence.

In order to give a complete formulation of these statistics, it is necessary to repeat the formulation of the t-test for significant differences. 3

The following formulae take into account the fact that the repellency index for untreated controls repeatedly shows significant day-to-day variation. This day effect is removed in the contrast

analysis, which includes an efficient statistical test of significance of variations from the mean of the control observations as follows:

Xi (C) is the mean of control observations on day i.
Xi (T) is the mean of test observations on day i.
Mi is the number of control observations on day i.
Ni is the number of test observations on day i.
Wi is the weight for the contrast for day i.

$$Wi = \frac{1}{\left(\frac{1}{Mi} + \frac{1}{Ni}\right)} \tag{1}$$

$$\overline{\mathbf{x}(\mathbf{c})} = \frac{\sum_{i=1}^{\Sigma} w_i \ x_i(\mathbf{c})}{\sum_{i=1}^{\Sigma} w_i}$$
 (2)

$$\overline{X(T)} = \frac{\sum_{i}^{\Sigma} Wi \ Xi(T)}{\sum_{i}^{\Sigma} Wi}$$
 (3)

$$K(T) = \overline{X(C)} - \overline{X(T)}$$
 (4)

where K(T) is the weighted average of the contrast for the test group.

Equation 4 is the optimum contrast weighted by the number of test and control observations on each day.

Let  $s^2$  represent the mean square error and let f be the number of degrees of freedom for the error in the analysis of variance for the day-to-day variation in control observations. Then the variance for the weighted average for the contrast of the test group, K(T), is:

$$Var K(T) = \frac{S^2}{\sum_{i}^{\infty} Wi}$$
 (5)

The two-tailed test of significance, allowing equal risk of variations above and below the control mean, is used at the 95% confidence limit. If,

$$\frac{K(T)}{\sqrt{\text{Var }K(T)}} > t_{.975}(f), \qquad (6)$$

then the test group, T, is significantly different from the control group at the 95% confidence level.

For comparison it is convenient to represent the repellency index of the tests as a percent of the repellency index of the controls:

Percent of controls = 
$$\frac{\overline{X(T)}}{\overline{X(C)}}$$

The upper limit for this percent of controls is a convenient indicator of significance as well as of the level of established merit, i.e., the distance from this upper limit or ranking. This upper limit is developed by multiplying by  $\sqrt{\text{Var } K(T)}$  and adding  $\overline{X(T)}$  on both side of the above inequality 6:

$$\overline{X(T)} + K(T) > \overline{X(T)} + t_{.975}(f) \sqrt{\text{Var } K(T)}$$
 (7)

The weighted average for the contrast for the test group as developed in a previous report<sup>3</sup> is:

$$K(\bar{T}) = \overline{X(\bar{C})} - \overline{X(\bar{T})}$$
 (8)

or the difference between the means of the control observations on day i and the test observations on day i.

Substituting in the left side of the above inequality (7) gives:

$$\overline{X(T)} + K(T) = \overline{X(C)}$$
 (9)

and dividing by the left side gives:

$$1 > \frac{\overline{X(T)} + \epsilon_{.975}(f) \sqrt{\text{Var } K(T)}}{\overline{X(C)}}$$
 (10)

Expression 10 is our test of significance. The right side of the expression is the upper bound for the percent of control repellency index. If this upper bound is equal to or greater than 1, the repellency index of the test compound is not significantly different from that of the untreated controls.

The number 1 is given in terms of percent, as previously shown, and is equivalent to 100 in the upper bound computation of the computer output.

This index is useful for indicating the level of reduction of biting that can be assured at a given point in testing. If few tests have been run, a compound that shows a low percent of control but has a high upper bound occasionally occurs.

This may seen contradictory. However, this result simply indicates that further testing may be required to establish the efficacy of the test compound.

The index automatically takes into account control variation and the number of test and control observations for all days of the test. Thus tests can be scheduled for convenience and maximum efficiency.

# V. PHYSIOLOGICAL INVESTIGATIONS OF GABA-CO, COMPLEXES

We performed a number of experiments with the crayfish intestine preparation described in past reports, in continuation of tests of the validity of the GABA-CO<sub>2</sub> hypothesis in a physiological system. Various modifications of the testing procedure had to be made, and it now appears that our test system is working. We have obtained presumptive evidence that a GABA-CO<sub>2</sub> complex may indeed diminish GABA inhibition. The methods and data will be discussed when more experimental evidence has been accumulated.

# VI. PERSONNEL AND RECORDS

The author is grateful to Mr. Clarence Boyle for his technical assistance in this work and to Mr. Merl L. Kardatzke for the development of the statistical methods and computer program used in analyzing the data. All data are recorded in Logbook C17599 and preserved in the form of keypunch cards, computer output sheets, and electronic and kymograph chart recordings.

Respectfully submitted, IIT RESEARCH INSTITUTE

Philip Kashin

Associate Biochemist Life Sciences Research

Approved by:

E. J. Hawrylewigz Assistant Director Life Sciences Research

PK/cg

#### APPENDIX

## ASSAY OF COMPOUNDS FOR REPELLENCY

The control values upon which the tests of repellency of the following compounds were based are shown in Appendix A. The abbreviated compound names and the treatments listed on the computer program are defined below.

Computer Listing	Compound Name, Formula and Treatment
AO- and YO- series	Supplied by Dr. R. P. Qaintana of the
	University of Tennessee.
3-NH2-1-PROPANOL	3-Amino-1-propanol
	$\operatorname{CH}_2(\operatorname{OH})\operatorname{CH}_2\operatorname{CH}_2(\operatorname{NH}_2)$
3-DEA-1-PROPANOL	3-Diethylamino-1-propanol
	$(c_2H_5)_2$ NCH $_2$ CH $_2$ CH $_2$ (OH)
1-DEA-2-PROPANOL	1-Diethylamino-2-propanol
	(c <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NCH <sub>2</sub> CH(OH)CH <sub>3</sub>
4-DEA-1-BUTANOL	4-Diethylamino-1-butanol
	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NCH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> OH
3-DMA-1-PROPANOL	3-Dimethylamino-1-propanol
	(CH <sub>3</sub> ) <sub>2</sub> N(CH <sub>2</sub> ) <sub>3</sub> OH
1-DMA-2-PROPANOL	1-Dimethylamino-2-propanol
	(CH <sub>3</sub> ) <sub>2</sub> NCH <sub>2</sub> CH (OH) CH <sub>3</sub>

Computer Listing	Compound Name, Formula and Treatmen's
4-DMA-1-BUTANOL	4-Dimethylamino-l-butanol
	(CH <sub>3</sub> ) <sub>2</sub> N(CH <sub>2</sub> ) <sub>4</sub> OH
1133TETRAMETHUREA	1,1,3,3-tetramethylurea
	(CH <sub>3</sub> ) <sub>2</sub> NCON (CH <sub>3</sub> ) <sub>2</sub>
DEA ACETONE	Diethylamino acetone
	(C2H5)2NCH2COCH3
Gaba-Ethyl-Ester	Gamma-aminobutyrate ethyl ester
	(NH <sub>2</sub> )CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> COOC <sub>2</sub> H <sub>5</sub>
2 AMETHOXYETHANOL	2-(2-Aminoethoxy)-ethanol
	H2NCH2CH2OCH2CH2OH
3-BUTENE-2-OL	3-Butene-2-ol
	CH <sub>3</sub> CH (OH) CH:CH <sub>2</sub>
4 AMBU TALLDDEAHWNB	4-Aminobutyraldehyde diethyl acetal
	Hydrolyzed in water with hydrochloric
	acid, neutralized with base
2AM-BENZALDEHYDE	2-Aminobenzaldehyde
	o-H <sub>2</sub> N(C <sub>6</sub> H <sub>4</sub> )СНО
NNDIE TMETCLBENZAM*	N,N-Diethylmetachlorobenzamide
	$m - (C_2H_5)_2NCO(C_6H_4)C1$
4DEAETHOXY BENZAD	$4-\left[\beta-(\text{Diethylamino})-\text{ethoxy}\right]$ -benzaldehyde
	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NCH <sub>2</sub> CH <sub>2</sub> OC <sub>6</sub> H <sub>4</sub> CHC

Submitted for testing by Johnson's Wax Corporation, Racine, Wisconsin.

Computer Listing Compound Name, Formula and Treatment NNDIPENYLFORMIDE N,N-Diphenylformamide  $\frac{\text{HCON}\left(\text{C}_{6}\text{H}_{5}\right)}{\text{DEAACETALD DEACET}}$  Diethylaminoacetaldehyde diethyl acetal  $\frac{\left(\text{C}_{2}\text{H}_{5}\right)}{2} \text{NCH}_{2}\text{CH} < \frac{\text{O}\left(\text{C}_{2}\text{H}_{5}\right)}{\text{O}\left(\text{C}_{2}\text{H}_{5}\right)}$ 

# CONTROL VALUES

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(Cont.)
VALUES
CONTROL

COMPOUND NAME	, F.	CONCENTRATION ON MCUSE (M./SC.INCH)	MCSCUTOES E4Ch0GED DES	TIME DISPLACED	REPELLENCY 1-05%	#IEGMTED PERCENT OF COMINGS	ΔeC	
							of Test	Test Number
		000000-0-	7.57	65.56	72.83		*	<b>.</b>
		000000-0-	9.62	77.10	56.85		<b>.</b>	4
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		00000°0-	30.44	35.48	141.48		45	51
		000000-0-	2.06	30*68	44.71		<b>6</b>	25
		900000	e5.36	04.36	163,78		<b>:</b>	4. Ki
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		00/00*0-	56.86	68.95	155+81		14	9
		000000	66.67	74.50	141.53		47	4
		000000	00.04	85.14	125.14		2.5	29
		000000	32.65	94.67	128.92		ro (* *	M ·
		33000-0-	71.62	/3.13	107,30		** ! **	<b>†</b>
		03300-9-	33,33	74.55	111.69		~	\$
		60000	44.43	30.75	11.021		***	¢ !
		000000	51.05	60.98	111.54		& (*)	20
		000000	16.67	48.75	()4*69		ひす	es es
		99999	16.00	74.74	90.74		<b>*</b>	<b>7</b>
		30000*0-	35.29	19.94	115.24		\$ **	0 6
		20000	200	26.45	04.27		**	;
		00000+0+	00.00	71.54	170071			2 ;
		000000	46.13	* C * C * C * C * C * C * C * C * C * C	130.34		Đ v	* -
		00000	100,40	10.01	4000		× 5	
		000000	00.4	22.85	26.65		9	1
		00000	34.6	48.56	52.40		( <del>(</del>	7.2
		00000	60.6	60.56	99.69		146	£.
		-0.00000	21.57	57.84	19.41		52	7.5
		000000	8,00	51.81	59.41		24	<b>6</b> 0
		00000	7.55	33•30	46.04		52	19
		00000-0-	17,31	50*09	77.40		53	62
		0000000	26.92	69.27	96.20		£4	69
		00000-0-	4.26	38.56	<b>*8*2</b> *		47	4%
		00000-0-	5.77	38.67	44.43		*	θλ
		-C 900000	20.41	17.36	97.79		5.5	3
		-09000°	20.42	93.45	119.87		55	64
		00000	14.61	75.80	300		26	<b>30</b>

(cont.)
VALUES
CONTROL

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Acideotech Nij-A-s-berg

COMPOUND NAME		90500110E5 Encorgeo	TIME DISPLACED	REPELLENCY	MIEG-IEC PERCENT OF			
	150 100 100 100 100 100 100 100 100 100				S THE S	Day		•
						<b>J</b> O	Test	
						Test	Z	
	00000-0-	28.85	77.85	106.70		\$\$		
	00000	17.65	79.43	97.46		15		
	00000	16.33	63.31	79.63		57		
	-0.00000	7.41	66.09	66.89		5.5		
	00000	15.00	20.66	99°29		**		
	-0.0000c	30-19	99.40	129.04		85		
	00000	20.75	78.17	96.93		50	45	
	-0.0000	24.53	88.38	113.90		59		
	000000-0-	12.9.	\$0.11	63.07		*	4	
	00000-0-	27.78	49.72	77.50		0.	36	
	000000-	00**7	71.19	85.19		70	\$	
	0°000°0−	22.04	83.3I	105.96		61		
	00000-0-	13.46	59.72	73.19		89		
	00000-0-	7.65	37.62	45.31		62		
	00000-0-	7.27	94.85	72.15		#0	•	•
	00000 <del>-</del> 0-	19.61	55.37	74.98		€9		
	20000-0-	25.45	81.82	107,28		*	105	
	300 <b>00*0-</b>	35.19	83.09	118.28		49	300	
	00000-0-	74.42	81.15	105.60		\$9	101	
	00000-0-	22.64	65.49	105.13		59	108	
	00000	19.61	42.22	61.02		***	Š	
	00000-0-	7.55	85.51	93,06			912	
	00000-0-	36.54	40.44	116.98		2	111	
	000000	22.45	21.10	73.55		2	112	
	00000-0-	10.20	56.24	66.49		•	113	
	00000-0-	30.00	73.12	103,72		m	174	
	00000	11.54	<b>66.39</b>	71.92		m		ı
	00000	7.41	52.84	60°54		*	116	
	00000	18.67	67.73	96.60		*	117	
	-0-00000	2.7	25+68	30.85		\$	116	
	00000-0-	14.01	72.87	87.69		•	119	
	-0.00000	9.26	56.30	95.59		~	120	
	00000	00°00	72.13	110,13		P	121	
	00000-0-	26-42	84.21	110.63		•	122	
CONTROL	00000-0-	22.48	64.69	91.97	100.0	-0.0000=CCNTRASI		
	!	15.52	19.53	32.45	107-51UPPER GUUND		ERROR	
		1		i				

ANALYSTS OF VARIANCE OF CONTROLS

	10 C 11 C 10 C 10 C 10 C 10 C 10 C 10 C	AND TO SELECTION OF CONTROLL		
EFFELT	5.5.	U.f.	A.5.	٠.
	196 96 36	5	1600 034	777
5	146404461	*	37441061	*000
ERROR	696*5*615	71.	731.633	
		4		
101AL	127442,359	121.	1053.243	

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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	* **********							
COMPOUND NAME	CONCENTRATION ON MOUSE IMG/SC.INCH)		TIME CISPLACEO (PCT)	REPELLENCY INDEX	#1EGHTED PERCENT OF CONTROL			
	***		!				Day	!
	00000-04	90.09	i C			L	Test Number	į,
	50.0000	03.0	3.23	5.90 3.21			77.	
	00000°0¢	00.0	1.00	1.60	1+c ( 49+3) UPPER SUUKE	90.4/96=CONTRAST 23.4249=STANDAND	L RROP	
	300000°0€	5.36	17.60	23.9e 76.45			# 6 # 6 # 6	-
	30°00¢	6.4 0.4 0.4 0.4	44.14	50.21 37.10	46.9 1 97.33 UPPER HOUND	56.8694_CONTRAST 27.0487=57ANDARD	ő	
	10.00000 10.00000	4.00	19.44	23.44			33	
	10.00000	7.10	41.22	48,32	45.1	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
		4°34	30.80	35.19 (	95.53 UPPER SOUND	24-1050=CUNIKAST 27-0487=574NGARO	£8808	
	\$.00000 \$.00000	2.13 7.55	15.55	17.68 50.59				
	\$.0000¢	78.4	32.30	37,13	37.9			
		9 <b>+</b> 63	23.68	27.51 (	#5.5) UPPER BOUND	23.4249=SIANDARD	ERROR	
	10.0000 20.00000	⊕ <b>0</b> • <b>0</b> • <b>0</b>	0.00	00.00			32 · 1 · · 32	
	30,00000	00000	00.00	00.0	0.0 64.1)UPPEP ESUND	24.2143±CONTRAST 27.0487±STANDARD ERROR		

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COMPOURD NAME	CONCLATENT, ON ON MOLSE (MG/SU+FECH)	AUSQUITOLS ENCORGED (PC3)	S TIME UISPLACED (PCT)	REPELLENCY 1-10-13	PESHTED PERCET OF CONTROLS	* ESHTED ERCET OF CONTROLS		Ř	± .
						1		Pest Test	Test Number
	10.00000	0,00	30°0 90°0	55.61 0.00				22	42
At.35	\$0,0000	3,77	24.03 33.98	27.80 39,32	33,6 97.1	33.c 97.l)upper bouso	56.4097:CONTRAST D 27.0487±STANDARD	T ERRCR	
A. 35	90000°;	16.98 3.92	61.08 33.92	98 utc 37 e84			- -	**	44
A( 3>	5.60060	10.45	57.50 33.35	67.95 42.58	69,3	69,3 117,6}UPPER BOUND	39.0608±CGHTRAST 23.4249±STARUARD	T ERROR	
	75.06660	90 <b>.0</b>	26.83	26.83				\$ <b>2</b>	. <b>~4</b>
	75.00000	00.0	26+83 +0+06	26.83 -0.00 (		21.8 72.5) UPPEE ROUND	96.1627=CONTRAST 31.2332=STANDARD	F ERROR	:
	00000°0%	00*0	0.00	00°3				28	m
	00000-04	00.00	00*0	00.0	3.0 50.7	0.0 50.77UPPER BIXUND	122,9960=LONTRAST 91,2332=51AMDARD	S-S-ROR	
	25,00000	00*0	00.00	00-0				\$2	
	25,00600	00.0	90°0-	00.0	50.7	0.0 50.7) UPPER BUUND	122.9960=CONTKAST 31.2332=STAMDARD ERROR	ERRCH	

PEPELLENCY OF COMPOUNTS CONTRASTED -ITH CUNTROL VALLES (CONT.)
CONCENTRATION MOSQUITOES TIME

TOTAL T

COMPOUND NAME	CENCENTRATION ON HOUSE (MG/SO-INCH)	#0560110E5 ENGORGED 4PCT)	TIME DISPLACED CPCTS	REPELLENCY IPEFX	WIEGHTED PERCENT OF CONTROLS	,	
			•		*****	Day	
A032						(F) 100 (F) 10	Test
	10+06050 10+00000	15.59	84.05 34.56	30.74			number 1
At. 32	10.00000	ř	;			34	2
		, , , , , , , , , , , , , , , , , , ,	53.93 23.65	33.46	45-4 (121-3) UPPt H BOUND	29-414-2-COLFAST 23-7233=51ARDAMI, ERROR	
A( 33							
	00100*64	0000	0.60	00-0			
4,733	969 <b>90</b> *65	90.0	90°0-	00*0-	0.0 0.00 - 1900 - 1000		**
A(-33						ANALISTO DATE ANTONIO	
	30°00000	00.0	13.66	13.66			
<b>A</b> : 33	30,0000	00.0	13.66	13.66	16.9 : 98.65 UPPER EN UND		<b>d</b>
A. 33						TOTAL CHEST AND SECURE OF THE CAME OF THE	
	10,00000	2-27	16.5c 70,23	18.85 92.68		\$ 0¢	
A(.3.3	10.0000	12.36 14.27	43.4 <u>1</u> 37.93	55,77 52,20 (	60.4 118.4)UPPER BUUND	<b>8</b>	
A:12~							
	00000*04 00000*04	0°00 1°93	5.76	5.76 35.82		04,	
A: 20	00000*05	0.9e 1.36	9.83 5.75	10,79	11.1 66.3)UPPER BOURD	ğ	:

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			_	VALUE & (CODE)	•			
COMPOUND NAME			S 1,7° 0152L4CEU (#CT)	REPELLENCY India	PEGENTED PEGENT OF CONTROLS			
		•			•		Day	
AC29						G		Heigh Miniber
	90000°0€	90°0 0	0.00	0.00				
A529	30,00000	9000	1.68 2.67	1.88	1.9 { 57.2>UPPER 50ULD	95.7219.COMTEAST 27.0487=57#0ARD ERROR	ERROR	•
Ar.2P								
	\$0*0000 \$0*0000	00°0	93°0	0°00 0°00			33	64.0
AC28	\$6*9000°	00.0	00.0	800	0.t ( 67.6)uPPER Buurd	79.8145=CUNTRAST 27.0487=STANDAND ERROR	£8808	•
A52a								
	30,00000 30,00000	3,77	51.61	35,39		•	ማ ነ ማ ሰ	*1 6
A. 28	30,0000	3.70	24.12	27-83 10-09 (	34.9 102.5500968 8/19.60	51.9876=CDMTRAST	5	•
£0.2c	10,00600	7.27	4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	66 66 80 10 10				<b>L</b> ud
AU28	10,00000	12.46	55.47		61.8 GNUG H3900 (4011)	42.4509sccwtrast 27.0487=STANDARC E	Š	<b>~</b>
AC22								
	90000°5	9.20 23.00	59.63	69.09 106.29			<b></b>	m N
42.1غ	\$*00000	16-17	71.57 16.53	87,69 26,30	79.4 ( 128.3)UPPER BUUND	22*6874=(0WTPAST 27*0487=5TAMDARD E	EKAROR	

PEPELLENCY OF CO-DOUGS CONTRASTED AITH COMTROL VALUES (COOL)
CONCELTRATION MUSDUITOES TIME

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	Å	Dest Names		35 ERROR	და ჩ 10 ა აზ გ	SE ROR	 *	37 2 1451 1480: ERRUR	os (	S. ESPOR	w.
				95+929+=CONTHAST 27+0+87=STANDARD		6%.8471=CONTHAST 27*0487=STANDARD		37 25.2445=CCN1.451 23-7233=51810ARD ERRUR		88+04+2±CG+1445T 23+42+9=51A+D-44D	
PERCENTED PERCENT OF CONTESTS				0.0 0.11UPYER FUUND		32.1 86.631PPER FLUID		29.5 C 68.e)UPPFF Found		27.9 61.510PPR P. BAUTED	
REPELLENCY Infex			00°0	93-9	30 to 00 to	32.04 30.96	60 Y		36.31 0.00	19.16 27.09 (	125,34
TIME DISPLACED (PCT)	•		0 0 0	00.0-	6.1.8	28.0e 28.15	9.89	26.11 22.93	34,23	27.32	######################################
#5500110ES E16086£0 (PCT)	1		03.0 03.0	90.0	2.00	2.63 2.63	1.92 9.26	5.59 5.19	80 O	46 68 78 78	24,00 2,06
CONCENTRATE ON CONTROL SE CHG/50+14CH)			00000°04	50,00000	00000*0£	30 <u>+</u> 00000	00000*35	00000 <b>÷0</b> ≤	30°0000°08	30.00000	10,00000 10,00000
COMPOULD MANE		Aulo		AC16	e 8-7-4	기 때 (· 박	A. 24	AC.34	• • • • • • • • • • • • • • • • • • •	#1,24	7 . · · ·

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i	Test Number 1 2	~	~ N M 4	٨.	~~ N M 4 N	~	48	~
Day	lest 1	ERROR	45 45 45 45 45 45 45 45 45 45 45 45 45 4	<b>1.8</b>	25 B B B B B B B B B B B B B B B B B B B	ERROR	11	ERRCR
ц	<b>1)</b>	76.0296.COKTRAST 27.0487=STANDARD		61.9540=CONTRAST 19.1263=STANDARD ERROR		62.6369=CONTRAST 16.1647=STANDARD E		142.8713=CCNTMAST 27.0487=STANDARD E
* (EG TE) PEKCENT OF COMPROLS		6+4 71+0)(PPER 30UND		44*1 ( 78*5)UPFEK ROUND		43.0 ( 72.3)UPPER PUUND		11.2   44.7)UPPER BOUND
REPELLENCY I'D+X	00°0	00.0	0.00 2.3.13 84.71 88.03	46.97	8 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	48.99 36.82	35.96	17.98
UISPLACE C	00 <b>°0</b>	30°0	00°0°0°0°0°0°0°0°0°0°0°0°0°0°0°0°0°0°0	37.64 33.49	7 -0 2 -0 8 -0 8 -0 8 -0 8 -0 8 -0 8 -0 8 -0 8	*1.22 29.62	34.00 00.0	17.00
#05cUITO S ENGORGED (PCT)	00.00 00.00 00.00	00.0-	0.00 8.70 10.33 24.49	11.13	9.00 0.00 4.00 14.58 16.33	7,77	1.9¢ 0.00	0.96
CONCENTRATION MUSCUITOES TEM ON MOUSE ENGORGED DISPLACED REPEL IMPASSAINCHE (PCT) OUT) INDE	00000 * 9¢	00000*05	10,0000 10,0000 10,0000 10,0000	10.00000	5.00000 5.00000 5.00000 5.00000 5.00000	000 <b>00*</b> \$	1.00000 1.00000	00000*1
COMPOUND SAME	AC 1.3	Ac13	\$1 -1 -2 -4	£	ACLO	A013	<b>4</b> 00 <b>6</b>	Y006

	Test	Number	į	15	•		•	, <b>6</b> (*)	•	~ ~	
	Day of	Test Z	ERROR	<b>3</b> 1	ERROR	•	ERROR	* * *	ERROR	<b>3 3</b>	ERRUR
	14 0	Te	72.10-2.CONTRAST 27.0487=STAMBARD		16.9225 CONTHAST 22.7255=5TANDARD		118-6375-CCNTRAST 31-2332-STANDARD E	•	106-6312=CCNTRAST 24-6920=STANDARD E		11.7263=CONTRAST 24.6920±51ANDARD E
	#1EGHTED PERCENT OF CONTROLS		55.2 ( 88.7)UPPER HOUND		71.8 ( 135.4) UPPER RUUND		0.0 52.5) UPPER BUUND		10.0 51.5) UPPER BOUND		90*1 131*6)UPPER BGUND
VALUES (Cont)	REPELLENCY INDEX	70.86 I 36.53	88.75 2 <b>5.</b> 29	00°0 00°0	45.44	00*0	00.0	2.77 20.85	11.81	73,58 140,25	106.91
	S TIME DISPLACED (PCT)	50.86 40.10	65.48	0.06 74.22	37.11 52.48	ე <b>0</b> •3	00.00	2.77 18.65	10.81	65.58 97.65	#1.61 22.58
ONTRASTED #	HUSQUITUE ENGORGED (PCT)	20.02	23,27	0.00	8.33 11.79	00.00	00.0	00°2	1.00	8 DU	25.30 24.46
	CONCENTRATION ON MOUSE (MG/SO.INCH)	0.10000	0-10000	0.01000	00010-0	10,50000	10,80000	1.00000 1.00000	1,00000	0.10000 0.10000	00001.0
HEPELLEWCY	ë	4006	Y 506	Y000	Youk	¥00.¥	4001	Y607	1007	Y(4)/	Y5.07

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CONTROL		1.4%
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CONTRASTED	*********	MCSDU170
COMPOUNTS		CONCENTRATION MOSANITORS TIME
9	i	Ĉ
REPELLENCY OF COMPOUNDS CONTRASTED WITH CONTROL VALUES (CODE)		

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•					:		-		•	
	Test Number 1		: # 8		42		- n		40	
	Of J	ERROR	<b>9 9</b>	ERRCR	23	ERROR	23	ERROR	27	ERROR
	ŭ	76.0729.contrast 27.0487=5tandard		36.9583=CUNTRASI 27.0487±STANDARD ERRUR		63.4886=CONTRAST 23.4249=STAMDARO		41.2290=CGNTRAST 23.4249=STANDARD		137.6743=CGHTRAST 27.0487=STAMDAKD ERROR
NIESMIED PERCENT OF CONTROLS		21.5 ( 77.2) UPPER HOUND		71.9 ( 117.5)UPPER BUUND		0.û < 73.6)UPPER ROUKD		35.1 ( 108.7)UPPER BOUND		1.5 ( .40.1)UPPER BOUND
REPELLENCY IND: X	23.93	20.82	40.487 78.497	59.93 26.95	05 <b>*0</b>	00.0	26.32 18,19	22.25 5.75	00°0 0°°	2.15 3.04
TIME DISPLACEL (PCS)	21.69	17.86 5.79	36.43 69.90	53.16 23.67	00°0	00.0	20.64	18-34 2-98	20°0 9°°9	2.15 3.04
MOSOUITOFS ENGORGED (PCT)	2.04	1.39	4 • 4 90 • 8	6.77 3.29	00.0	000	5.88 1.96	3.92	00.0	000
CONCENTRATION CN MOUS: CMG/SL.INCH)	1,50000	1.00000	0+10000 0+10000	0000	1.00000 1.00000	1.00000	0.10000	0.10000	1.00000	1.50000
COMPOUND NAME	YCOP	YGOE	700%	Y00#	3-MHZ-1-PROPANDE	3-Nri2-1-PHUPANOL	3-M12-1-PHUPANOL	3-NH2-1-PHUPANOL	3-DEA-1-PROPANOL	3-5EA-1-PROPANOL

• !	rest umber 1 2		#7		~ N		~		# <b>~</b>	
Day of	z	ERROR	4 10	ERROR	\$ \$ \$ \$	ERROR	53.33	ERROR	57	ERRGR
L L	J	85.7395.CONTHAST 27.0487=57ANDAR(: (		15.2801=CONTRAST 22.7255=STANDARD 8	•••	86.7964=CONTRAST 27.0487=STANDARD	•••	56.3332.CONTRASI 27.0487=STANDARD E		36.7952=CONTRAST 24.6920=STANDARD E
WIEGHTED PERCENT OF CONTROLS		38.7 77.31UPPER SOUND		77.2 : 144.6)UPPER SQUND		C.O 62.2) UPPER BOUND		35.1 97.3)UPPER BOUND		55.0 ( 115.2)UPPER BUUND
VALUES REPELLENCY Index	38.60 69.57	54.09 21.90	54.82 49.04	51.93	90°0	00.0	23.67 37.26	30.46 9.61 (	35.80 54.28	45.04
S TIME DISPLACED (PCT)	96. 67. 64.	47.47	4 6 6 0 0 0 0 0	44.35 1.20	0000	00.0	21.67	26.52	31.3c	38.74
MOSQUIDES ENGORGED (PCT)	2.13 11.11	6.62 6.35	11.92 3.65	7.58	00.00	00.0	2.00 8.00 8.00	3.94	4 80 4 4 6 6	6.30 2.63
REPELLENCY OF COMFOUNDS CONTRASTED WITH CONTROL VALUES CONCENTRATION MOSQUITOES TIME UND NAME ON MOUSE ENGORGED DISPLACED REPELL (MG/SQ-INCH) (PCT)	0.10000	0.10000	0.01000	6.01000	1,00000	1.00000	00001*0	0.16000	0.01000	00010*0
REPELLENCY COMPOUND NAME	3-DEA-1-PROPANOL	3-DEA-1-PHOPANOL	3-DEA-1-Phupanol	3-DEA-1-PROPANOL	1-DEA-2-PHOPANDL	1-DEA-2-PHOPANOL	1-05.4-2-P40PANOL	1-DEA-<-PROPANOL	1-DEA-2-PHOPANOL	1-DEA-2-PROPANOL

REPELLENCY OF COMPOUNDS CONTRASTED WITH CONTROL VALUES (COM
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0.00100	O NAME		MCSOUITOES ENSORCED (PCI)	TIMP DISPLACED (PCT)	REPELLENCY INDEX	NIEGHTED PERCENT OF CONTROLS			
0.00100	PROPANOL		† • •	<b>.</b>	* • • • • • • • • • • • • • • • • • • •	•	Ľ		Test
0.00100		0.00100	0°00 8°33	0.00	0.00				<b>4</b> 7
1,00000 0,50 0,00 0,00 0,00 0,00 0,00 0,	-PROP≜HOL	00100*0	4*17 5*89	24.05 34.01	28.22	34.5 ( 94.7) UPPER BOUND	53.6194=Contrast 24.6920=Standard		
1.00¢6u   0.00	-60TA 40E	1.00000	900	00.0	00.0			នព	<del></del> 0
0.10600         0.00         0.00         0.00         0.00         23           0.10000         0.00         0.00         0.00         0.00         23.4286±CGNTRAST           0.10000         0.00         0.00         0.00         0.00         23.4286±CGNTRAST           0.01000         0.00         0.00         0.00         23.4286±STANDARD         24.286±STANDARD           0.01000         0.00         0.00         0.00         23.4289±STANDARD         24.2849±STANDARD           0.01000         0.00         0.00         0.00         0.00         24.83         1         99.21 UPPER         80 UND         24.6920=STANDARD	-9-17414OL	1.00060	00000 0000	00.0	00.0	0.0 ( 73.6) UPPER SOUND	63.4886=CONTRAST 23.4249=STANDARD	ERROR	
0.010000 0.00 0.00 0.00 0.00 0.00 23.4249=5TANDARD FROM 0.01000 0.00 0.00 0.00 0.00 0.00 0.00 23.4249=5TANDARD FROM 0.01000 0.00 0.00 0.00 13.90 12.3 0.921UPPER BOUND 24.4920=5TANDARD FROM 0.01000 0.00 0.00 0.00 0.00 0.00 0.00 0	RUTANOL	091000	0.00 0.00	00.00	00*0				N
0.01000         0.00         0.00         0.00         24           0.01000         0.00         13.90         12.3         49.7183=CONTRAST         24           0.01000         0.00         6.95         6.95         12.3         49.7183=CONTRAST         24           0.01000         0.00         0.00         0.00         0.00         0.00         24.6920=STAMBAD ERROR           0.00100         4.08         24.86         28.96         22.5         42.1905=CONTRAST         24           0.001         2.04         12.44         14.48         25.5         42.1905=CONTRAST         24           2.48         17.59         20.48         ( 112.55) UPPER BOUND         24.6920=STAMBAD ERROR         24.6920=STAMBAD ERROR	BOTANOL.	0.10000	00.0	00.0	00.0	0.0 73.6)UPPER 30UND	63.4886±CCNTRAST 23.4249±57ANDARD	ERROR	į
0.01000 0.00 0.95 0.95 12.3 49.7183±CONTRAST RROR 0.00 0.00 0.00 0.00 0.00 0.00 0.00	E., TANOL	0.01000	00*0	0,00 13,90	0.00			<b>5</b> ¢	- 2
0.00100 0.00 0.00 0.00 24 24 24 24 24 24 24 24 24 24 24 24 24	SCTASOL	0.01900	00*0	6.95 9.83	6.495 9.83	12.3 : 99.2) UPPER BGUND	49.7183±CGNTRAST 24.6920=STANDARD		
0.00100 2.0. 12.4. 14.48 25.5 62000 2.1905=CONTHAST 20.48 ( 112.5)UPPER BOUND 24.6920=STANDARD	<b>BUTANOL</b>	00100*0	0°0 0°4 80°4	0.00	0.00 28.96			**	÷ 70
	BLTANOL	00.00100	7 % 6 % 6 % 7 %	12.44			42.1905=CONTRAST 24.6920=STANDARD		

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REPELLENCY OF COMPOSINDS CONTRASTED WITH CONTROL VANCES AND A	Ģ	COMPOSINDS (	CONTRASTED	1111	CONTROL	28.447	1	
	ŧ	********					(Court)	
	Ŝ	CONCENTRATION MISCHITTORS	MISCHALLE					
TOTAL CAME OF COLUMN TOTAL TOTAL COLUMN TOTA			3010000	n	, L			3

COMPOUND NAME	ON MOUSE	ENGORGED	UISPLACED	REDELLERON	blegent of			
******	(MG/SG. INCH)	(PC1)	(PCT)	I-mex	CONTROLS			
		! •	•	******			Day	
3-DMA-1-PROPANCE								
	1.00000	11.76	76. 83	;		F	Test Number	
	1.00000	11.11	53.44	64.55			1 95	
3-DMA-1-PKOPANUL	1.00000	11.44	56,35	67.79	68.7 ( 123.4) UPPER SOUND	30.8689 CONTRAST 27.0487=514~UARD		
3-DHA-1-PKCPAROL								
	0.10000	31.48	78.61 76.50	93.43 107.98			۳. نه .	
3-D44-1-PxCPANGL	0.10000	23,15	77.56 1.49	100.71	102.1 ( 156.8)UPPER BJUND	-2-0-14-CONTKAST 27-0487=51ANDARD	36 ERPCR	
3-DKA-1-PHOPANOL								
	0.01000	00.00	0.00	0.00			и 0	
3-URA-1-PROPANOL	0.01000	00.0	3.33 4.71	3.33	4.7 ( #1.5)UPPER BUUND	66.9542sCONTHAST 27.0487sSTANDARD	SU Z	
3-DMA-1-PROPANOL								
	90100°0	1.92 3.85	23.61	25.53			~ ·	
3-DMA-1-Phepanol	0.00100	2.88 1.36	32,72 12,88		50.7 t 127.4)UPPER BOUND	34.6857=CONTRAST 27.0487=STAHEARD E	60 2 ERROR	
1-584-7-PROPAGOL								
	1.00000	7.55 5.17	30.08	72.71 35.77		vr u	( 	
1-UMA - 3-PHOPANOL	1.00000	99.9	47.58	56. 26	7 73	•		
		1.26	24.87	26.12 (	112.5) UPPER BOUND	41.9109=CONTRAST 27.0487±51ANDARD ERROR	RROK	

(Cont)	
VALUS	
U WITH CONTROL VALUES (CORE)	*****
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REPELLENCY OF COMPOUNDS CONTRASTLU	
COMPOUNDS	
5	ì
REPELLENCY	********

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rest .	Number 1 2		+4				~ Z		: ** <b>N</b>	
7 84 84		ERROR	**	ERROR	. 86	PAROR	\$\$	ERROR	\$ \$ \$	;
tid	Ĕ	42.1770=COMTRAST 27.0487=STAMDARD ERROR		71.7075=CONTRAST 27.0487=STANDARD ERROR		23.5868=CONTRAST 27.04&7=51AHDARD		92.9379=CONTRAST 24.6920=STAMDARD		92.9379±CCNTRAST
PLEGHTED PLEGENT OF CONTROLS		56.1 112.3) UPPFR BOUND		32+6 83.31UPPER BOUND		77.5 128.5) UPPER 90ttD		0.0 53.0) UPPER BOUND		0.0
REPELLENCY Inde X	35.50	53.97 26.12 (	42.81 26.60	34.71	83.29 82.37	82.63 0.65 (	0000	00.0	00.0	00.0
S TIMI CISPLACED (PCT)	31.66 59.95	45.86 20.00	38.5c 24.64	31.60 9.64	77.73 69.16	13.45	0000	00.0	00°0	0 <b>0°</b> 0
MUSUUITOE ENGORGED (PCT)	3.85	8.17	4.26 1.94	3.11	5.56 13.21	9.38 5.41	00.0	000	00*0	00.0
CONCENTRATION ON MOUSE. (#6/54.1HCH)	0.10000	0.10000	6.01000 0.01000	0001000	0.00100 0.00100	0.00100	1.06000 1.00000	00000*1	0.10000 0.10000	0.10000
COMPOUND NAME	1-DA-2-PROPANOL	1-04A-2-PHOPANOL	1-DHA-S-PRUPANOL	1-DHA-2-PHOPANOL	1-DMA-2-PROPANOL	1-DMA-2-PKUPANOL	4-DMA-1-HUTANOL	4-DHA-1-BUTANDE	4-DMA-1-EUTANOL	4-0KA-1-6UTANOL

CONCENTRATION MUSCUITOES TIME WALLES (Cont.)
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	fest Number 1 2		<b>~</b> ~ ~							
		ERROR		ERROR	ed us		~~~	ERROR	₩ N	R CR
ä	of Test 25 25	94.9379-CGHTPAST 24.6920=STARDARINE	\$ 8	75-3165 ±CGNTRAST 24.6920=51ANDARD E	<b>30 to</b>	53.3874±CONTRASI 27.0487±STANDAKU ERROR	4 4 4	64.5142±CONTHAST 19.9768±STALDARD ER	24	48.0902=CONTRAST 27.0487=STANGARC ERROR
WIEGHTED PERCENT OF CONTEGS		0.0 0.4340) UPPER ROUND		19.6 ( 72.6) LPPER SOUND		53.9 ( 100.5)UPPER BOUND		39.0 ( 76.7)UPPEH HCUND		18.6 109.9)UPPER BOUND
REPELLENCY 1-0EX	00°0	00-0-	6.00 35.24	17.62 24.92	\$1.15 73.72	15.96	0.60 31.48 71.85	36.65	19.83 2.49	11.16
TIME DISPLACED (PCT)	90°9	30.0	0,00	14.74	47.07	51.40	0.00 27.40 57.57	28+32 28+80	17.91	10.20
MOSCUTTOES ENCORGED (MCT)	0000	00.0	0.00 5.77	2.88 4.08	*•06 18•00	11.04 9.84	0.00 4.0d 14.29	6.12 7.36	1.92	1.35
CONCENTRATION ON FOUSE (#G/SO.IHCH)	0.01060 0.01000	0.61000	0.00100 0.00100	0.00100	1 • 00000 1 • 00000	1.00000	00001*0 00001*0	0.10000	0.01000	0.010.0
CCMPOUID NAME	4-044-1-80TANGE	4-DMA-1-801An0L	4+DMA+1+HUTA40E	4=[MA=]=6J7ANOL	1133TETKAPETHUREA	1135TETHANETHUKEA	1133TFTGAMETAUKEA	1133TFTKAMETHÜREA	1133TFTHAMETHUNEA	1133TFTHAMETHUREA

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REPELLENCY OF COM	DF COMPOUNDS C	POURUS CONTRASTED WITH CONTROL	TH CONTROL	VALUES (CORE)				
COMPOUND NAME	CONCENTRATION ON ACUS: (MG/S-1-1HCH)	MOSOUITOES ENGORLED (PCI)	TIME DISFLACED (PCI)	REPELLENCY 176: X	* 16GM:ED PERCE1 OF CONTROLS	•		Test
1133TETRAMETMAREA	0010000	00*0	<b>4.25</b> 9.25	4.25 9.25			1 est 1 62 62 62 62	1 2
1133TETRAMETHUPEA	0010000	0000	6.75 3.53	6.75 3.53	11.4 ( 162.5) UPPER 5JUND	52.4949=CONTRAST 27.0487=51AMDARD	ERRCA	
EFA ACETO &	1.06006	10.00	66.93 45.93	81.2½ 55.91			\$ 6	~ N
UFA ACETONE	1.00000	12.14 3.03	14.80	68.56	73.2 ( 121.4)UPPER BOUND	25.1254=CONTRAST 22.6306±STANDAKD ERROR	ERRO	
D. A ACETONE	0*10000	12.50	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	82.44 49.13			<b>⋄⋄</b>	~ ~
DIA ACETOILE	0000100	8.0 9.0 8.0 8.0 8.0	57.21 18.01	65.79 23.56	70.7 ( 118.4) UPPER BOUND	27.9011=CONTHAST 22.6306=STANDARD	ERRUR	<b>A.</b>
GASA-F THYL-ESTEN	10.00000	11.11	67.51 22.95	78.62 27.04			4 4 4 4	- 7
GAB4-ETHYL-ESTER	10-00000	7.60	45.23 31.51	52.83 36.45	41.1 ( 75.4) UPPER SOUND	75.6004=CCNTRAST 22.0852±51ANDARD	ERROR	•
G/BA-FTHYL-ESTER	1.00000	26.06 3.85	72.51 36.19	92.31 46.03			\$ \$	# N
GABA-ETHYL-ESTER	1,00000	11.92	54.25 25.54	36.96	51.5 ( e5.8) UPPER BOUND	±2,2614±CONTRAS1 22,0852±STAHDARU ERROR	ERRO	

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	Test Number 1									
	# H ~ ~	or.	** **	ox.	N		~~~	~	47	
Day	Test 65	E8808	\$ 3	E-RRUR	% %	SARCI	2 %	ERROR	22	ERROR
		74.5049=Contrast 27.0487=Standard		36.9072.CONTHAST 27.0487=STANDARD		60.8017=COMTRAST 27.0487±STAMDARD ERRGR		39.6433.CCNTRAST 27.0487#STAMDAKD		56.6690=CONTRAST 26.6920=STAMDARD
*IEG*IEU PERCENT OF CONTROLS		29.5 ( 80.5) UPPER SGUND		65.6 ( 116.2)UPFER BYOND		44.1 ( 93.7)CPPER BOUND		63.6 [ 113.2)UPPER BOUND		0.0 86.9)UPPER BOUND
REPELLENCY I-UFX	6,00	30.86 43.64	82,20 54,71	65.46	30,38 65,67	48.03 24.95	96.97	39.29	00°0	00.00
TIME UISHLACEU (PCT)	0.00	22.37 31.63	62.20 37.40	9.04 17.04 44.04	24.72	40°20 21°89	76.97 35.02	99°62	0°00	90.0
MOSCUITOES E-460RGED (PCT)	30°°3 30°°3 30°°3	8 - 4 9 2 - 0 8	20.00 17.31	18.65 1.90	5.66	7.83 3.07	50°02	13.19	000 000 000	00.0
CONCENTRATION ON MOUSE (#G/SO.INCH)	3 • 00000 3 • 00000	1.00000	0.10600	000 <b>01*</b> 0	0.0100 0.01000	00010*0	0.00100 0.00100	0.00100	1.00000	1,00000
COMPCUND NAME	22A-ETHOXYETHANGL	22AME THOXYE THANUL	22AYETHOXYETHANGL	22A /ETHONYETHANDL	36-2-3::3100-6	3+8UTf 2.£ +2+0L	3+6UTE:2E+2+UE	3-8JTERF-2-0L	4AMBUTTEDIS ANANS	4ambetaldoramme

766684999								
COMPOUND RAME	CONC. PERATION ON MOUSE (MC/SC. BPCR)	ENGORCEC FROORCEC FPCT)	SPLACE?	REPERLENCY	PENCENT OF CONTROLS		Ď	
44MBUTALDDC AMAND							OF T	Test
	31.0	05.0	00.00	00.00			7,	-
	0000170	00.0	0000	90.0			ž	4 N
	0 10000	9 6	20-12	20.12			Š	m
	00001-0	8•00	33.70	41.10			ያ	+
44MOUTALDOFAMANS	0000100	2.00	14.95	16,95	28,9	43.9818sCONTRAST		
		39 <b>*</b> *	17.54	50.59	C 83.73 UPPER BOUND	16.9942=STANDARD	SRROR	
47Mb4T4LDS_A inko								
	0.010.0	14.00	61.16	75.10			*	
	0.01000	1.90	5.90	7.62			2 %	4 0
	0.01000	5.56	35.75	41.30			3 5	, ,
	0.01060	00*0	15.97	15.97			8	٠.
44MSUTALOT CANNAU	0.01000	5.38	29.71	35.09	38.5	54,4627+76818451		
		61.6	24.35	30,27	C 18.4 YUPPER BUUND	17+7075=STAMDAKD	ERROR	
4EMBUTZEDIN A. IAND								
	0.00100 0.00100	4.52 4.00	53,35	59-87 24-00			200	<b></b> :
7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		,					9	ų
チャンじじょんしじじ: たいたいに	00100*0	3.26 - 76	39.16			73.7339=CONTRAST		
		•	600	62017	CSOSSICHTER BOOKS	27.048725IARDARD	XXX	
4 A MEXUTAL DOS ANDENS								
	0,000,0	11.11	55.17	66.28			•	*1
	010000	9.43	55.75	65,18			'n	~
4 APPROTATIONS APPRILE	0.00010	10.27	55.46	65.73	0.686 0.000	1.3437=CONTRAST		
		A * * * *	 •		MON-OFOTTHE EDGED	22.7255=STANDARD ERROR	15 XX	

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				Z		7	ei .	•		<b>&amp;</b>			pot (	N 1	ጥ ቀ	•	er S	;			r4 /	41	m 4	•				grid.	۲,	m	*	w	ø	د م		
		Dev	<b>'</b>	Test	Я;	አ :	33	7	FRASI	DARC ERROR			Ď.	, c	2 25		KAST OARD ERR			Ş		* *	X \$		KAST OARB SBROR			51	7,5	25	25	61	19	<b>~</b> 1 ~	•	とうてい
									63.4157.COATRASI	14.9942=51A							63-4157=CORTRAST 16-99-4-57A-OARD ERROR								16.2362ESTANDARD											TOTAL CONTROL
	MIEGHED PERCENI OF CONTROLS	•								DA-DUNEYER BOUND						Š	53.53 CPPEP 4 JUND							-	61.23 UPPER CAUME										37.5	4 - 100 Supplement
VALUES (Cont.)	REPELLENCY			90.00	000	00.0	00.0			00.0-		0,60	00.00	95.5	80.0	5	95.0			9	00	2,40	000	0.00	1.20		•	9 6	224.6	27.20	20.05	00-0	33,53	30,89	26.82	21 04
Th COMTRUE	S TIME DISPLACED	•		0.00	000	0.00	30.0	•	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	•		00.0	30.0	0.00	00.0	00.0	20.0-			00*0	90.0	2+40	00.0	99°C	1.20		0	9 5	30.5	10.34	7000	0.00	27.76	25-23	23.94	10.64
POUNDS COMIMASTED WITH COMERUE	POSOUTOES EMCJRCED CPCTII			00.0	00.0	0.00	0a ° 0	6	9000	•		96.0	00*0	<b>0</b> 0°0	00.0	00 0	00.0-			0.00	00.0	00.0	00.0	0.00	06.00		ć	3.	4	1.59	2.04	00.0	5.77	<b>%</b>	2.87	2.27
OF COLPOUNDS C	CONCENTRATION CHICKLET ION CHICKLET (HOVE)			1.00000	1-00000	00000	1.00000	00000	0000						60001-0	0.10000				0+01000	0901000	000100	0001000	0.02000			000000	00100	0.00100	0.00100	0,00100	0,00100	0.00100	0010000	0.00100	
بو	COMPOUND WANE		24%-BENZALDENYDE					ZAM-REMZAL DELIYDE			24n-6F52410E-YUF					JAM-UFALACOEHYDE		•	ZAM-BFNZALDERYDE					ZAWASI + ZALBEHYDE		240=040 44 DESYPE									SAM-FERZALDEMYDE	

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VAL:JE S	
CONTRUE	
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COMPOUNDS	
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REPELLENCY	

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COMPOUND NAME	z	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TITH CONTRUCT	VALUES (CONT.)	) WIEGHIED PEKCENI OF		
_	(MG/SO. RACH)	(FCT)	CPCT)	LADEN	CONTROLS		Ved
						•	
	0.000.0	4.26	13.41	17,67		•	rear Number
	0.00010	4.25	16.96	23.21			1 t
	0.000.0	16,26	78.78	92.66			7
	010000	00.0	000	00.0			•
	0.00010	36.89 5.56	34.71	107,43			
	0.000.0	0					9
		14.26	31.80	16.64	45.57 HOB.61 UPPER BOUND	24.9430±CONTRAST 15.6166±STANUARD ERROR	ERROR
	0.0000	6,00	17.79	23.79			
	1000000	4.17	24.94	29.11			24 44 7
	1000000	5.08 1.30	21.37	3,76	60.6 1 184.3)UPPER BOUND	17.1847±CONTRAST 27.0487±STAKDARD	ERROR
	1.00000	0000	00.0	00.00			-
	00000	8	000	00,9			63
	1.00000	000	• • • • • • • • • • • • • • • • • • •	99.0			
	1.00000	00.00	2.41	2.41	3-1		
		00.0-	4.82	6.82	50.41 UPPER HOUND	14.62502CDNINASI 16.2962ESTANDARD ERROR	ERROR .
	0.10000	12.50	50.63 57.91	63.13 70.41			en (n
	00001.0	12.50	54.27	66.77	62.7 ( 143.8)UPPER BOUND	13.9268aCCNTRAST	
						ことに とこうし こうしょく ラナイ	12 C L

		f Test it Number 1	ERROR	# 'V	æ	~ ~	ERROR	<b>~</b> 14	ERROA	~ ~	1
	Pa <u>v</u>	Test Base Base Base	25.9823=COMT.45T 24.6920=5TANUAMP ER	. <b>4</b> 1 40	10-8759±CONTRAUT 24-6920=51Ardari: Error	<b># M</b>	73-5639-CONTRAST 27-0487=STANDARD ER	***	99.3773#CONTRAST 27.0487#STAMDARD ERI	\$ \$ \$	86.6875#CONTRAST
	#1EGHTED PERCENT OF CONTROLS		67.8 128.8) LPPEN BOLND		H6.5 147.5) UPPER BOUND		0.0 73.4)UPPER BOURD		11.9 59.7)UPPER BOUND		23.1
VALUES (CORE)	REFELLENCY	48.40 61.03	54.71	98°C7	69.77 25.88 (	00°0	00*2	19.92	13,40 9,23 (	15.17 37.02	26.09
	TIME PCT)	41.87 55.15	48484 4848	76.53 47.31	61.92 20.66	990 0 0	00.0-	15.76	10.34	13.20 30.63	21.92
ONTRASTED WI	MOSGUITOES ENGORGED D1S (PCT)	5.52 5.68 6.88	0.20	11.54	7.65 5.2:	0°00 0°00	00.00	4.17 1.96	3.00 1.56	96.00 96.00 97.00	F 1 4 4
	CONCERTRATION ON HOUSE CMG/SO.INCH)	0.01000	0001000	0.00100 0.00160	0-00100	00001*0	0.10000	0.010.0	0.01000	0.00100	00100*0
HEPELLENCY OF		NNDIETAETCLUENZAM	NNDIETKETCLBEGZAM	NICLET! ETCLSENZER	Nifolet of TCL 9E1.Zam	sault rat TCL aurzer.	MAJIET ETCLOSISAR	NNOTETMETCLSE 12 48	MIGIETHETCEDESZAM	NNSTE TRETCL BENZAR	REDIET' ETCLBEGZAM

	Test Number 1	; 	:		÷ -				!	
: 	Per Man	EAROR		47 2 Error		64		49 2 EMROR	** (	
	•	36-1879±COMTRAST 22-0852ESTANDARD		40.8809±CONTRAST 22.0852±STAMDARD		51.7206#CONTRAST		52.6327 cCONTRAST 22.6306#STAEDARD E		51.9525±COMTRAST 22.7255±STAMDARD #9000
#:EGP:ED PERCENT OF		71.8 106.1)UPPER BOUND		68.2 102.51 UPPER BUUND		44.8 93.4) UPPER BOUND		43+8 92-01 UPPER BOUND		22.5 90.13UPPER BOUND
vALUES (CORt) REPELLENCY IMBEX	100.04	92.24 11.03 (	110.15	87,55	33.75	50.19 41.97 11.52 (	54.21 27.90	41.05	22.02 8.92	15.47
S TIME ELSPLACED	68.13 54.04	2.89	78.15	<b>62.55</b> 22.07	27.62	42.49 35.06 10.51	3 9 6 0 9 9 9 9 9	37.21 18.60	10.02	11.55
CONTRASTED WITH CONTRCL HGSGUITOES TIME ENGORGED EISPLACED (PCT) (PCT)	31.91 20.41	66.16 6.14	32.00 18.00	25.00 9.90	6,12	6.91 1.13	ы ф. ж. ж.	00°0-	1.85	3.93
- · ·	1.00000	1.00000	0.10000 0.10000	0-10000	1.00000	1.00000	0.10000 0.10000	0.10000	0.01000	0.01000
REPELLENCY OF COMPGUNDS COMPOUND NAME ON MUDSL (MG/DU-INCM)	4DEAETHOXY BLNZAD	4DEAETHOXY BENZAD	4DEAETHOXY BEWZAD	4DEAETHOXY BENZAD	NND I PHENYL FORMI DE	MIDIPHENYLF ORMIUC	NNO I PHF R.YL.F ORMI DE	NNDIPSENYLFORMIDE	NNDIPENYLFURMIDE	NNDIPENYLFURMIDE

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CONCENTRATION MUSCUITOES ITSE
ON MUNSE EMGORGED DISPLACE (MG/50-IHCM) (PCT)
*****
1.00000 7.84 1.00000 22.45
1.00000 15.15 10.33
0-10060 12-24 0-10060 5-88
0.10000 9.0e